

ABSTRACT OF THE DISCLOSURE

An isolation trench formed in a semiconductor substrate and is filled with at least one insulating liner layer that is deposited along sidewalls and a bottom region of the isolation trench and with at least one silicon liner layer that is deposited atop the insulating liner layer. An upper portion of the insulating liner layers are removed, and the silicon liner layers are removed. A remaining portion of the trench is filled with another insulating layer.